

08/818534

FILE 'CAPLUS' ENTERED AT 16:01:13 ON 08 FEB 2000

L6 17298 SEA FILE=CAPLUS ABB=ON PLU=ON (BACTERI## OR MICROORGANI  
SM OR MICRO ORGANISM) (5A) (DETERM? OR DETECT? OR DET## OR  
SCREEN?)

L8 24 SEA FILE=CAPLUS ABB=ON PLU=ON L6 AND RAMAN

L9 24 SEA FILE=CAPLUS ABB=ON PLU=ON L8 AND SPECTR?

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L9 ANSWER 1 OF 24 CAPLUS COPYRIGHT 2000 ACS

ACCESSION NUMBER: 2000:37031 CAPLUS

TITLE: Rapid biological agent identification by  
surface-enhanced **Raman**

**spectroscopy**

AUTHOR(S): Farquharson, Stuart; Smith, Wayne W.; Elliott,  
Susan; Sperry, Jay F.

CORPORATE SOURCE: Advanced Fuel Research, Inc., East Hartford, CT,  
USA

SOURCE: Proc. SPIE-Int. Soc. Opt. Eng. (1999), 3855 (Air  
Monitoring and Detection of Chemical and  
Biological Agents II), 110-116  
CODEN: PSISDG; ISSN: 0277-786X

PUBLISHER: SPIE-The International Society for Optical  
Engineering

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The Chem. Weapons Convention prohibits the development, prodn.,  
stockpiling, and use of warfare agents (chem. and biol.), and  
requires their destruction. Yet their use persists and has been  
included in the terrorist's arsenal. Currently, a no. of anal.  
methods are being developed to perform rapid measurements of trace  
agents to ensure treaty compliance, as well as safe environments for  
military personal and the public at large. We have been  
investigating the ability of surface-enhanced **Raman**  
**spectroscopy** to detect bacterial nucleic  
acid-base pairs with sufficient sensitivity and selectivity to  
eliminate the need for enumeration used in polymerase chain  
reactions and culture growth, required by other measurement  
techniques. The design of a small vol., fiber optic coupled,  
electrolytic sample cell is presented along with anal. of DNA and  
RNA sepd. from non-toxic bacteria.

L9 ANSWER 2 OF 24 CAPLUS COPYRIGHT 2000 ACS

ACCESSION NUMBER: 1999:342323 CAPLUS

DOCUMENT NUMBER: 131:211171

TITLE: Vibrational **spectroscopy** as a probe to  
rapidly detect, identify, and  
characterize micro-organisms

AUTHOR(S): Sockalingum, Ganesh D.; Lamfarraj, Hasnae;  
Searcher : Shears 308-4994

Beljebbar, Abdelilah; Pina, Patrick; Delavenne, Marc; Witthuhn, Fabienne; Allouch, Pierre; Manfait, Michel

CORPORATE SOURCE: Unite MeDIAN, IFR 53, UFR Pharm., Univ. de Reims Champagne-Ardenne, Reims, Fr.

SOURCE: Proc. SPIE-Int. Soc. Opt. Eng. (1999), 3608(Biomedical Applications of Raman Spectroscopy), 185-194  
CODEN: PSISDG; ISSN: 0277-786X

PUBLISHER: SPIE-The International Society for Optical Engineering

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Fast and exact identification of a great no. of microorganisms is becoming a serious challenge. Differentiation and identification of microorganisms is today mainly achieved by the use of a variety of distinct techniques based on morphol., serol. aspects and a set of biochem. test. Vibrational **spectroscopic** techniques can be complementary and useful methods in this field due to their rapidity, 'fingerprinting' capabilities, and the mol. information that they can provide. Using SERS at Ag colloids, we have conducted pilot studies to rapidly **detect** and identify **bacterial** clin. strains. Using a **Raman** microspectrometer equipped with a He/Ne laser, a first attempt to record SERS **spectra** was made on colloidal solns. **Spectra** were of good quality but not very reproducible due to the movement of the microorganisms. Strains were then put in presence of Ag colloids and direct on-plate anal. was performed. **Spectra** were more reproducible, with diminished fluorescence, and reveal characteristic cellular-level information. Different growth conditions and colloid preps. have been tested. *Pseudomonas aeruginosa* and *Escherichia coli* clin. strains, responsible for nosocomial infections, have been our first test samples. An attempt has also been made to record SERS data from gold colloids in view of future measurement in the near-IR. **Spectroscopic** data are compared with ATR-FTIR results.

L9 ANSWER 3 OF 24 CAPLUS COPYRIGHT 2000 ACS

ACCESSION NUMBER: 1999:342321 CAPLUS

DOCUMENT NUMBER: 131:225675

TITLE: Surface-enhanced **Raman**  
**spectroscopic** monitor of triglyceride  
hydrolysis in a skin pore phantom

AUTHOR(S): Weldon, Millicent K.; Morris, Michael D.

CORPORATE SOURCE: Dep. Chem., Univ. of Michigan, Ann Arbor, MI, USA

SOURCE: Proc. SPIE-Int. Soc. Opt. Eng. (1999), 3608(Biomedical Applications of Raman Spectroscopy), 168-174

Searcher : Shears 308-4994

08/818534

CODEN: PSISDG; ISSN: 0277-786X  
PUBLISHER: SPIE-The International Society for Optical Engineering  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB Bacterial hydrolysis of triglycerides is followed in a sebum probe phantom by microprobe surface-enhanced Raman scattering (SERS) spectroscopy. The phantom consists of a purpose-built syringe pump operating at physiol. flow rates connected to a 300 .mu. i.d.capillary. We employ silicon substrate SERS microprobes to monitor the hydrolysis products. The silicon support allows some tip flexibility that makes these probes ideal for insertion into small structures. Propionibacterium acnes are immobilized on the inner surface of the capillary. These bacteria hydrolyze the triglycerides in a model sebum emulsion flowing through the capillary. The transformation is followed in vitro as changes in the SERS caused by hydrolysis of triglyceride to fatty acid. The breakdown products consists of a mixt. of mono- and diglycerides and their parent long chain fatty acids. The fatty acids adsorb as their carboxylates and can be readily identified by their characteristic spectra. The technique can also confirm the presence of bacteria by detection of short chain carboxylic acids released as products of glucose ferment. during the growth cycle of these cells. Co-adsorption of propionate is obsd. Spatial localization of the bacteria is obtained by ex-situ line imaging of the probe.

L9 ANSWER 4 OF 24 CAPLUS COPYRIGHT 2000 ACS  
ACCESSION NUMBER: 1999:90269 CAPLUS  
DOCUMENT NUMBER: 130:121841  
TITLE: Raman optrode processes and devices for detection of chemicals and microorganisms  
INVENTOR(S): Grow, Ann E.  
PATENT ASSIGNEE(S): USA  
SOURCE: U.S., 41 pp.  
CODEN: USXXAM  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

| PATENT NO. | KIND | DATE     | APPLICATION NO. | DATE     |
|------------|------|----------|-----------------|----------|
| US 5866430 | A    | 19990202 | US 1997-864015  | 19970527 |

AB A methodol. and devices for detecting or monitoring or identifying chem. or microbial analytes are described. The methodol. comprises four basic steps: (1) the gas or liq. medium to be monitored or analyzed is brought into contact with a bioconcentrator which is

Searcher : Shears 308-4994

used to bind with or collect and conc. one or more analytes; (2) the bioconcentrator-analyte complex is then exposed to radiation of one or more predetd. wavelengths to produce **Raman** scattering **spectral** bands; (3) at least a portion of the **Raman spectral** bands are collected and processed by a **Raman spectrometer** to convert them into an elec. signal; and (4) the elec. signal is processed to detect and identify, qual. and/or quant., the analyte(s). The methodol. of this invention may also comprise **Raman** reactive capacity anal. of the bioconcentrator itself, simultaneously with or independently from the detection of the analyte, to det. the potential ability of the bioconcentrator to complex with analytes; the results of this latter anal. may be used to affect or alter or modify the methodol. involved in detection and anal. of the analytes. Also the invention is accomplished by a **Raman** optrode comprising: a bioconcentrator capable of binding with the analyte(s); a mechanism or procedure or device for bringing the gas or liq. sample into contact with the bioconcentrator; a light source suitable for generating **Raman** scattering; a **Raman spectrometer** capable of collecting and processing the **Raman** scattering **spectral** information and translating it into an elec. signal; and electronic hardware and software for analyzing the elec. signal and translating the signal into information on the presence, identity and/or quantity of the bound analytes. Various forms of bioconcentrators are described, as well as a variety of analytes which may be detected, monitored, or identified by this invention, and a variety of devices which can be fabricated based on this invention.

L9 ANSWER 5 OF 24 CAPLUS COPYRIGHT 2000 ACS

ACCESSION NUMBER: 1998:640392 CAPLUS

DOCUMENT NUMBER: 129:257346

TITLE: Direct detection of bacteria  
-antibody complexes via UV resonance  
**Raman spectroscopy**

INVENTOR(S): Nelson, Wilfred H.; Sperry, Jay F.

PATENT ASSIGNEE(S): The Board of Governors for Higher Education,  
State of Rhode Island and Provi, USA

SOURCE: PCT Int. Appl., 13 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO.    | KIND | DATE     | APPLICATION NO. | DATE     |
|---------------|------|----------|-----------------|----------|
| WO 9841842    | A1   | 19980924 | WO 1998-US4623  | 19980310 |
| W: AU, CA, JP |      |          |                 |          |

Searcher : Shears 308-4994

08/818534

RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL,  
PT, SE

AU 9864555 A1 19981012 AU 1998-64555 19980310

EP 966662 A1 19991229 EP 1998-910272 19980310

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,  
PT, IE, FI

PRIORITY APPLN. INFO.:

US 1997-818534 19970314

WO 1998-US4623 19980310

AB A system for the **detection of bacteria** antibody complexes is disclosed. A sample to be tested for the presence of a bacteria is placed in a medium which contains antibodies attached to a surface for binding to a specific bacteria to form an antigen to antibody complex. The medium is contacted with an incident beam of light energy. Some of the energy is emitted from the medium as a lower resonance enhanced **Raman** backscattered energy. The presence or absence of the **microorganism** is **detected** based on the characteristic **spectral peak** of said microorganism. Escherichia coli was reacted with rabbit anti-E. coli antibodies and the reaction mixt. was put into a continuous cycle loop feeding through a quartz flow cell positioned in a laser beam. Laser light 242 nm was directed into the flow cell. The emitted light energy (resonance enhanced **Raman** scattering) was sensed with a **Raman** detector.

L9 ANSWER 6 OF 24 CAPLUS COPYRIGHT 2000 ACS

ACCESSION NUMBER: 1998:588814 CAPLUS

DOCUMENT NUMBER: 129:287465

TITLE: Surface enhanced **Raman spectroscopic** monitor of P. acnes lipid hydrolysis in vitro

AUTHOR(S): Weldon, Millicent K.; Morris, Michael D.; Harris, A. B.; Stoll, Janice K.

CORPORATE SOURCE: Department of Chemistry, University of Michigan, Ann Arbor, MI, 48109-1055, USA

SOURCE: J. Lipid Res. (1998), 39(9), 1896-1899  
CODEN: JLPRAW; ISSN: 0022-2275

PUBLISHER: Lipid Research, Inc.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Surface enhanced **Raman spectroscopy** (SERS) at a silver microelectrode was used to monitor bacterial hydrolysis of triglycerides in lipid mixts. that model sebaceous gland secretions. Mixts. of wax esters, squalene, triolein, and triisostearin were used as model skin secretions. The transformation was followed in vitro as changes in the SERS caused by hydrolysis of triglyceride to fatty acid. The fatty acid was adsorbed as its carboxylate, which is readily identified by the characteristic band at ca. 1395 cm<sup>-1</sup>. Co-adsorption of propionate was also obsd. The technique can also confirm the presence of **bacteria by detection of**

Searcher : Shears 308-4994

short chain carboxylic acids released as products of fermm. during the growth of these cells.

L9 ANSWER 7 OF 24 CAPLUS COPYRIGHT 2000 ACS

ACCESSION NUMBER: 1998:505812 CAPLUS

DOCUMENT NUMBER: 129:228260

TITLE: A comparative study of conserved protein interactions of the primary electron donor in photosynthetic purple bacterial reaction centers

AUTHOR(S): Ivancich, Anabella; Mattioli, Tony A.

CORPORATE SOURCE: Departement de Biologie Cellulaire et Moleculaire, CEA and CNRS URA 2096, CEA/Saclay, Section de Biophysique des Proteines et des Membranes, Gif-sur-Yvette, 91191, Fr.

SOURCE: Photosynth. Res. (1998), 55(2-3), 207-215

CODEN: PHRSDI; ISSN: 0166-8595

PUBLISHER: Kluwer Academic Publishers

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The pigment-protein interactions within the binding site of the bacteriochlorophyll (BChl) dimer constituting the primary electron donor (P) in several, native, photosynthetic **bacterial** reaction centers have been **detd.** using Fourier transform **Raman spectroscopy**. For reaction centers whose primary sequence data are available, and assuming a structural analogy with the Rb. sphaeroides RC whose high-resoln. three-dimensional structure is known, amino acid residues donating hydrogen bonds to P are proposed. Consequently, one may propose the microenvironment structure of the primary donors studied and correlate this deduced structure with the known absorption and redox properties of the primary donors. In a mini-review of past work, the authors group and classify the primary donors with respect to their specific H-bonding interactions with the protein. This classification reveals trends in the H-bonding and certain physicochem. properties such as the P.degree./P.bul.+ redox midpoint potential, the pos. charge distribution over the dimeric primary donors in their oxidized radical cation state P.bul.+, and the absorption maxima of the lower exciton Qy absorption band of P.

L9 ANSWER 8 OF 24 CAPLUS COPYRIGHT 2000 ACS

ACCESSION NUMBER: 1998:475767 CAPLUS

DOCUMENT NUMBER: 129:242013

TITLE: FT-IR and FT-NIR **Raman spectroscopy** in biomedical research

AUTHOR(S): Naumann, D.

CORPORATE SOURCE: Robert Koch-Institute, Berlin, 13353, Germany

SOURCE: AIP Conf. Proc. (1998), 430 (Fourier Transform Spectroscopy), 96-109

CODEN: APCPCS; ISSN: 0094-243X

Searcher : Shears 308-4994

PUBLISHER: American Institute of Physics  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB FT-IR and FT-NIR **Raman spectra** of intact microbial, plant animal or human cells, tissues, and body fluids are highly specific, fingerprint-like signatures which can be used to discriminate between diverse microbial species and strains, characterize growth-dependent phenomena and cell-drug interactions, and differentiate between various disease states. The **spectral** information potentially useful for biomedical characterizations may be distributed over the entire IR region of the electromagnetic **spectrum**, i.e. over the near-, mid-, and far-IR. It is therefore a key problem how the characteristic vibrational **spectroscopic** information can be systematically extd. from the IR **spectra** of complex biol. samples. In this report these questions are addressed by applying factor and cluster anal. treating the classification problem of microbial IR **spectra** as a model task. Particularly interesting applications arise by means of a light microscope coupled to the FT-IR **spectrometer**. FT-IR **spectra** of single microcolonies of less than 40 .mu.m in diam. can be obtained from colony replica applying a stamping technique that transfers the different, spatially sepd. microcolonies from the culture plate to a special IR-sample holder. Using a computer controlled x,y-stage together with mapping and video techniques, the fundamental tasks of microbiol. anal., namely **detection**, enumeration, and differentiation of **micro-organisms** can be integrated in one single app. Since high quality, essentially fluorescence free **Raman spectra** may now be obtained in relatively short time intervals on previously intractable biol. specimens, FT-IR and NIR-FT-**Raman spectroscopy** can be used in tandem to characterize biol. samples. This approach seems to open up new horizons for biomedical characterizations of complex biol. systems.

L9 ANSWER 9 OF 24 CAPLUS COPYRIGHT 2000 ACS

ACCESSION NUMBER: 1998:370875 CAPLUS

DOCUMENT NUMBER: 129:133250

TITLE: Infrared and NIR **Raman spectroscopy** in medical microbiology

AUTHOR(S): Naumann, D.

CORPORATE SOURCE: Robert Koch-Institute, Berlin, 13353, Germany

SOURCE: Proc. SPIE-Int. Soc. Opt. Eng. (1998),  
3257(Infrared Spectroscopy: New Tool in  
Medicine), 245-257

CODEN: PSISDG; ISSN: 0277-786X

PUBLISHER: SPIE-The International Society for Optical  
Engineering

DOCUMENT TYPE: Journal

Searcher : Shears 308-4994

LANGUAGE: English

AB FT-IR and FT-NIR **Raman spectra** of intact microbial cells are highly specific, fingerprint-like signatures which can be used to (i) discriminate between diverse microbial species and strains, (ii) detect in situ intracellular components or structures such as inclusion bodies, storage materials or endospores, (iii) detect and quantify metabolically released CO<sub>2</sub> in response to various different substrates, and (i.v.) characterize growth-dependent phenomena and cell-drug interactions. The characteristic information is extd. from the **spectral** contours by applying resoln. enhancement techniques, difference **spectroscopy**, and pattern recognition methods such as factor-, cluster-, linear discriminant anal., and artificial neural networks. Particularly interesting applications arise by means of a light microscope coupled to the **spectrometer**. FT-IR **spectra** of micro-colonies contg. less than 10<sup>3</sup> cells can be obtained from colony replica by a stamping technique that transfers micro-colonies growing on culture plates to a special IR-sample holder. Using a computer controlled x,y-stage together with mapping and video techniques, the fundamental tasks of microbiol. anal., namely **detection**, enumeration, and differentiation of **micro-organisms** can be integrated in one single app. FT-IR and NIR-FT-**Raman spectroscopy** can also be used in tandem to characterize medically important microorganisms. Currently novel methodologies are tested to take advantage of the complementary information of IR and **Raman spectra**. Representative examples on medically important microorganisms will be given that highlight the new possibilities of vibrational **spectroscopies**.

L9 ANSWER 10 OF 24 CAPLUS COPYRIGHT 2000 ACS

ACCESSION NUMBER: 1998:135839 CAPLUS

DOCUMENT NUMBER: 128:138331

TITLE: **Raman spectroscopic method**  
for identification of biological contaminant in  
sample using deuteration

INVENTOR(S): Harhay, Gregory P.

PATENT ASSIGNEE(S): Harhay, Gregory P., USA

SOURCE: Eur. Pat. Appl., 36 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND     | DATE     | APPLICATION NO. | DATE     |
|------------|----------|----------|-----------------|----------|
| EP 818674  | A2       | 19980114 | EP 1997-305121  | 19970711 |
| EP 818674  | A3       | 19980729 |                 |          |
|            | Searcher | :        | Shears          | 308-4994 |



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R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,  
PT, IE, SI, LT, LV, FI, RO

AU 9728592 A1 19980122 AU 1997-28592 19970711  
PRIORITY APPLN. INFO.: US 1996-678649 19960711

AB The invention provides a method of identifying an analyte in a sample, said method comprising: (i) treating said sample with a deuterating agent; (ii) directing monochromatic light at said sample; (iii) detecting **Raman** light signal from said sample; (i.v.) and comparing said **Raman** light signal with a std. whereby to identify said analyte. Biol. contaminants in a sample may efficiently be identified using a **Raman spectroscopic** method in which the sample is pretreated with a deuterating agent.

L9 ANSWER 11 OF 24 CAPLUS COPYRIGHT 2000 ACS

ACCESSION NUMBER: 1997:361634 CAPLUS

DOCUMENT NUMBER: 127:31242

TITLE: Non-invasive methods for determining live or death of freeze-preserved microorganisms in a sealed container

INVENTOR(S): Hamaguchi, Hiroo; Suzuki, Eiichiro; Ishihara, Masaru; Yamanaka, Shigeru

PATENT ASSIGNEE(S): Kanagawa Kagaku Gijutsu Academy, Japan; Ajinomoto Co., Inc.

SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.  
CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO.  | KIND | DATE     | APPLICATION NO. | DATE     |
|-------------|------|----------|-----------------|----------|
| JP 09121889 | A2   | 19970513 | JP 1995-283589  | 19951031 |

AB Disclosed is a non-invasive method for detg. whether the freeze-preserved **microorganisms** in a sealed container are still alive or dead by using **Raman spectroscopy**, without the need of opening the container. The method is based on the ratio of CO<sub>2</sub>/O gas in the container.

L9 ANSWER 12 OF 24 CAPLUS COPYRIGHT 2000 ACS

ACCESSION NUMBER: 1995:1007323 CAPLUS

DOCUMENT NUMBER: 124:53980

TITLE: Dairy product analysis: identification of **microorganisms** by mid-infrared **spectroscopy** and determination of constituents by **Raman spectroscopy**

AUTHOR(S): Fehrmann, Angela; Franz, Monika; Hoffmann, Searcher : Shears 308-4994

08/818534

CORPORATE SOURCE: Andreas; Rudzik, Lutz; Wuest, Eberhard  
Milchwirtschaftliche Lehr- Untersuchungsanstalt,  
Hannover, 30453, Germany  
SOURCE: J. AOAC Int. (1995), 78(6), 1537-42  
CODEN: JAINEE; ISSN: 1060-3271  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB Identification of microorganisms by traditional microbiol. methods is time consuming. The German Federal Health Office has developed a method using mid-IR **spectroscopy** to identify microorganisms rapidly. This method has been modified for application to microorganisms (esp. Clostridium) important in the dairy industry. Mid- and near-IR **spectroscopies** are well-established methods for quant. measurements of fat, protein, lactose, and solid content in a variety of products. A disadvantage of both methods is the huge absorption due to water; extn. of other components is complicated and can be achieved only statistically. With **Raman spectroscopy**, water causes less absorption. The use of **Raman spectroscopy** as a quant. method for milk powder was evaluated.

L9 ANSWER 13 OF 24 CAPLUS COPYRIGHT 2000 ACS  
ACCESSION NUMBER: 1994:453485 CAPLUS  
DOCUMENT NUMBER: 121:53485  
TITLE: Antibiotic susceptibility test  
INVENTOR(S): Nelson, Wilfred H.  
PATENT ASSIGNEE(S): Board of Governors for Higher Education, State of Rhode Island and Providence Plantations, USA  
SOURCE: PCT Int. Appl., 18 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

| PATENT NO.  | KIND | DATE     | APPLICATION NO. | DATE     |
|---|------|----------|-----------------|----------|
| WO 9411526  | A1   | 19940526 | WO 1993-US11036 | 19931118 |
| W: AT, AU, BB, BG, BR, BY, CA, CH, CZ, DE, DK, ES, FI, GB, HU, JP, KP, KR, KZ, LK, LU, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SK, UA, VN |      |          |                 |          |
| RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG                        |      |          |                 |          |
| US 5573927  | A    | 19961112 | US 1992-977670  | 19921118 |
| AU 9456066  | A1   | 19940608 | AU 1994-56066   | 19931118 |
| PRIORITY APPLN. INFO.:  |      |          | US 1992-977670  | 19921118 |
|   |      |          | WO 1993-US11036 | 19931118 |

AB The invention relates to a method for biodetection and identification of antibiotic susceptibility in bacteria by creating  
Searcher : Shears 308-4994

**Raman spectra** against target cells and comparing them. Thus, an *Escherichia coli* culture in the lag phase was divided and 1 portion was treated with rifampin. The 2 cultures were subjected to pulsed laser-emitted UV light at 242 nm and the back-scattered **Raman spectra** were compared. The comparison showed that rifampin greatly lowered the peak in the **spectrum** caused by ribosomes, indicating that cell growth was inhibited.

L9 ANSWER 14 OF 24 CAPLUS COPYRIGHT 2000 ACS

ACCESSION NUMBER: 1994:176498 CAPLUS

DOCUMENT NUMBER: 120:176498

TITLE: Vibronic mixing in the strong electronic coupling limit. **Spectroscopic** effects of forbidden transitions

AUTHOR(S): Lathrop, Elizabeth J. P.; Friesner, Richard A.

CORPORATE SOURCE: Department of Chemistry, Columbia University, New York, NY, 10027, USA

SOURCE: J. Phys. Chem. (1994), 98(11), 3050-5  
CODEN: JPCHAX; ISSN: 0022-3654

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The authors consider an excited-state manifold in which an allowed transition is strongly coupled electronically to a forbidden (dark) state and use nonperturbative methods to det. the effects of this coupling on the optical properties. The authors find that the strong coupling limit is qual. different from the usual weak coupling case; in particular, the bright state **spectrum** is substantially altered, displaying renormalized Franck-Condon factors which are obsd. in absorption, hole burning, and resonance **Raman** expts. The authors map out the magnitude of this renormalization as a function of various parameters in the theory and note that there is a phase-transition-like behavior as one passes from the weak to the strong coupling regimes. Finally, the authors suggest that this mechanism provides a straightforward explanation for the hole-burning **spectra** obsd. for the primary donor in the **bacterial** photosynthetic reaction center and det. a region of parameter space compatible with the exptl. results.

L9 ANSWER 15 OF 24 CAPLUS COPYRIGHT 2000 ACS

ACCESSION NUMBER: 1994:90290 CAPLUS

DOCUMENT NUMBER: 120:90290

TITLE: Ultraviolet micro-Raman spectrograph for the detection of small numbers of **bacterial** cells

AUTHOR(S): Chadha, S.; Nelson, W. H.; Sperry, J. F.

CORPORATE SOURCE: Dep. Chem., Univ. Rhode Island, Kingston, RI, 02881, USA

Searcher : Shears 308-4994

08/818534

SOURCE: Rev. Sci. Instrum. (1993), 64(11), 3088-93  
CODEN: RSINAK; ISSN: 0034-6748

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The construction of a practical UV micro-Raman spectrograph capable of selective excitation of bacterial cells and other microscopic samples was described. A refractive objective is used to focus continuous-wave laser light on a sample and at the same time collect the scattered light at 180.degree.. With the aid of a quartz lens the image produced is focused on the slits of a spectrograph equipped with a single 2400 grooves/mm grating optimized for 250 nm. Spectra were detected by a blue-intensified diode array detector. Resonance Raman spectra of Bacillus subtilis and Flavobacterium capsulatum excited by the 257.2 nm output of a continuous-wave laser were recorded at 900-1800 cm<sup>-1</sup>. Bacterial cells were immobilized on a SiO<sub>2</sub> plate by polylysine and were counted visually. Cooling was required to retard sample degrdn. Sample sizes ranged 1-50 cells with excitation times 15-180 s. Excellent spectra were obtained from 20 cells in 15 s using a spectrograph having only 3% throughput.

L9 ANSWER 16 OF 24 CAPLUS COPYRIGHT 2000 ACS

ACCESSION NUMBER: 1992:546501 CAPLUS

DOCUMENT NUMBER: 117:146501

TITLE: UV resonance Raman spectroscopic detection and identification of bacteria and other microorganisms

AUTHOR(S): Nelson, Wilfred H.; Sperry, Jay F.

CORPORATE SOURCE: Dep. Chem., Univ. Rhode Island, Kingston, RI, 02881-0801, USA

SOURCE: Mod. Tech. Rapid Microbiol. Anal. (1991), 97-143. Editor(s): Nelson, Wilfred H. VCH: New York, N. Y.  
CODEN: 58AEAV

DOCUMENT TYPE: Conference

LANGUAGE: English

AB The use of resonance Raman and esp. UV resonance Raman spectroscopy for the detection and identification of microorganisms are described. To explain the complex spectra of microorganisms in terms of the spectra of bacterial taxonomic marker compds. is emphasized. The reader is alerted to problems encountered in the use of UV resonance Raman spectroscopy. As well as to the potential for future studies is also mentioned.

L9 ANSWER 17 OF 24 CAPLUS COPYRIGHT 2000 ACS

ACCESSION NUMBER: 1989:169613 CAPLUS

Searcher : Shears 308-4994

08/818534

DOCUMENT NUMBER: 110:169613  
TITLE: Rapid detection of bacteria  
and other microorganisms: a basic  
study in the application of resonance  
Raman and time-resolved fluorescence  
spectroscopies  
AUTHOR(S): Nelson, W. H.  
CORPORATE SOURCE: Dep. Chem., Univ. Rhode Island, Kingston, RI,  
USA  
SOURCE: Report (1988), ARO-22367.11-LS; Order No.  
AD-A194719, 22 pp. Avail.: NTIS  
From: Gov. Rep. Announce. Index (U. S.) 1988,  
88(20), Abstr. No. 851,719  
DOCUMENT TYPE: Report  
LANGUAGE: English

AB Resonance Raman Spectra were obtained for a  
variety of chromobacteria by using low-power 488-nm excitation.  
Spectra are simple, of high quality, and useful for  
identification purposes at the species level. Raman  
microprobe studies show conclusively that spectra can be  
obtained from single cells in pure cultures or in mixed cultures  
without the need for sepn. Extensions of the study were made to  
representative colorless gram-neg. and gram-pos. bacteria. Spora  
other than bacteria have been studied as well. Pollen, mold spores,  
bacterial spores, algae, and viruses all give spectra but  
only viruses and bacterial spores appear to give intense UV  
resonance Raman spectra. The primary  
fluorescence of bacteria was studied in detail to  
det. its potential in rapid detection. Fluorescence was  
detd. for S. epidermidis, P. fluorescens, E. cloacae, E. coli, and  
B. subtilis. Fluorescence contributions were assigned in part to  
tryptophan, pteridines, related flavins, and pyridine coenzymes.

L9 ANSWER 18 OF 24 CAPLUS COPYRIGHT 2000 ACS

ACCESSION NUMBER: 1987:455901 CAPLUS  
DOCUMENT NUMBER: 107:55901  
TITLE: SERRS as a probe for pigments located near the  
surfaces of bacterial photosynthetic membranes  
Picorel, Rafael; Holt, Randall E.; Cotton,  
Therese M.; Seibert, Michael  
CORPORATE SOURCE: Sol. Energy Res. Inst., Golden, CO, 80401, USA  
SOURCE: Prog. Photosynth. Res., Proc. Int. Congr.  
Photosynth., 7th (1987), Meeting Date 1986,  
Volume 1, 423-6. Editor(s): Biggins, John.  
Nijhoff: Dordrecht, Neth.  
CODEN: 55RQAT  
DOCUMENT TYPE: Conference  
LANGUAGE: English  
AB The application of SERS to probe non-destructively for the presence  
Searcher : Shears 308-4994

of the carotenoid spirilloxanthin near the surface of photosynthetic membranes of *Rhodospirillum rubrum* was demonstrated. The exposed membrane surface of chromatophores (cytoplasmic side out) and spheroplast-derived vesicles (periplasmic side out) were examd. and it was shown that the carotenoid was located on the cytoplasmic side of the photosynthetic membrane.

L9 ANSWER 19 OF 24 CAPLUS COPYRIGHT 2000 ACS

ACCESSION NUMBER: 1986:105425 CAPLUS  
DOCUMENT NUMBER: 104:105425  
TITLE: A resonance **Raman** microprobe study of chromobacteria in water  
AUTHOR(S): Dalterio, R. A.; Nelson, W. H.; Britt, D.; Sperry, J.; Purcell, F. J.  
CORPORATE SOURCE: Dep. Chem., Univ. Rhode Island, Kingston, RI, 02881, USA  
SOURCE: Appl. Spectrosc. (1986), 40(2), 271-2  
CODEN: APSPA4; ISSN: 0003-7028  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB Resonance **Raman spectra** of *Flavobacterium aquatile*, *F. arborescens*, *Rhodopseudomonas palustris*, and *Rhodospirillum rubrum* in aq. suspension were obtained at high resolu. With highly pigmented *R. rubrum*, 1-3 organisms were sufficient for a good **spectrum**; the less highly pigmented chromobacteria required 10-12 (*flavobacteria*) or 25 (*R. palustris*) organisms. The high sensitivity suggests the usefulness of **Raman spectroscopy** for detection of individual **bacterium** in complex mixts.

L9 ANSWER 20 OF 24 CAPLUS COPYRIGHT 2000 ACS

ACCESSION NUMBER: 1985:58716 CAPLUS  
DOCUMENT NUMBER: 102:58716  
TITLE: Quantitative analysis of nucleic acids, proteins, and viruses by **Raman** band deconvolution  
AUTHOR(S): Thomas, George J., Jr.; Agard, David A.  
CORPORATE SOURCE: Dep. Chem., Southeast. Massachusetts Univ., North Dartmouth, MA, 02747, USA  
SOURCE: Biophys. J. (1984), 46(6), 763-8  
CODEN: BIOJAU; ISSN: 0006-3495  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB A constrained, iterative Fourier deconvolution method is employed to enhance the resolu. of **Raman spectra** of biol. mols. for quant. assessment of macromol. secondary structures and H isotope exchange kinetics. In an application to the Pfl filamentous bacterial virus, it is shown the **Raman** amide I band contains no component other than that due to .alpha.-helix,  
Searcher : Shears 308-4994

indicating the virtual 100% helicity of coat proteins in the native virion. Comparative anal. of the amide I band of 6 filamentous phages (fd, If1, IKe, Pf1, Xf, and Pf3), all at the same exptl. conditions, indicates that the subunit helix-percentage ranges from a high of 100% in Pf1 to a low of 71% in Xf. Deconvolution of amide I of Pf3 at elevated temps., for which an .alpha.-to-.beta. transition was previously reported, allows quant. evaluation of the contributions of both .alpha.-helix and .beta.-strand conformations to the structure of the thermally perturbed viral coat protein. Weak **Raman** lines of viral DNA bases and coat protein side chains, which are poorly resolved instrumentally, are also distinguished for all viruses by the deconvolution procedure. Application to the C-8 H isotope exchange reaction of a purine constituent of tRNA permits accurate detn. of the exchange rate const., which is in agreement with calcns. based upon curve-fitting methods.

L9 ANSWER 21 OF 24 CAPLUS COPYRIGHT 2000 ACS  
 ACCESSION NUMBER: 1981:152758 CAPLUS  
 DOCUMENT NUMBER: 94:152758  
 TITLE: **Resonance Raman spectroscopy**  
 in the study of carotene-containing biomolecules  
 and microorganisms  
 AUTHOR(S): Nelson, Wilfred H.  
 CORPORATE SOURCE: Dep. Chem., Univ. Rhode Island, RI, USA  
 SOURCE: Am. Lab. (Fairfield, Conn.) (1981), 13(3), 94,  
 96-8, 100-1  
 CODEN: ALBYBL; ISSN: 0044-7749  
 DOCUMENT TYPE: Journal; General Review  
 LANGUAGE: English  
 AB A review with 38 refs.

L9 ANSWER 22 OF 24 CAPLUS COPYRIGHT 2000 ACS  
 ACCESSION NUMBER: 1980:185583 CAPLUS  
 DOCUMENT NUMBER: 92:185583  
 TITLE: A resonance **Raman** method for the rapid  
 detection and identification of  
 bacteria in water  
 AUTHOR(S): Howard, W. F., Jr.; Nelson, W. H.; Sperry, J. F.  
 CORPORATE SOURCE: Dep. Chem., Univ. Rhode Island, Kingston, RI,  
 02881, USA  
 SOURCE: Appl. Spectrosc. (1980), 34(1), 72-5  
 CODEN: APSPA4; ISSN: 0003-7028  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB **Resonance Raman spectra** are reported for 16  
 types of carotene-contg. bacteria and algae in aq. dispersion.  
**Spectra** are obtained with ease from organisms grown in  
 culture and collected by centrifugation. In many instances  
 Searcher : Shears 308-4994

**spectra** produced with 488 nm incident radiation are sufficiently different to provide a basis for identification. While most information is contained in the 900-1600 cm<sup>-1</sup> region, several bacteria exhibit pronounced carotenoid overtone and combination bands which can be assigned along with the fundamental vibrations.

L9 ANSWER 23 OF 24 CAPLUS COPYRIGHT 2000 ACS

ACCESSION NUMBER: 1977:27441 CAPLUS  
 DOCUMENT NUMBER: 86:27441  
 TITLE: Preliminary evaluation of LIDAR techniques for advance warning of biological threats  
 AUTHOR(S): Hoyer, Walter  
 CORPORATE SOURCE: Nav. Weapons Lab., Dahlgren, Va., USA  
 SOURCE: U. S. NTIS, AD Rep. (1974), AD-917105, 51 pp.  
 Avail.: NTIS  
 From: Gov. Rep. Announce. Index (U. S.) 1976, 76(22), 246  
 CODEN: XADRCH  
 DOCUMENT TYPE: Report  
 LANGUAGE: English

AB Equations were developed to predict the capabilities of laser radar techniques for **detection** of airborne **microorganisms**. In order to discriminate threat microorganisms from normal atm. contents, optical interactions such as fluorescence and **Raman** scatter must be utilized. Selected optical properties of microorganisms, mostly bacteria, were explored. Preliminary exptl. results of the ultraviolet and visible optical d., the **spectral** fluorescence characteristics, and the fluorescence quantum efficiency of microorganisms are reported. The results are corrected for instrument biases and, in general, show characteristic nucleic acid and protein absorption in the ultraviolet while tryptophan and chlorophyll fluorescence are predominant. A preliminary value of 12% was obtained for the tryptophan quantum efficiency of *Escherichia coli*. The results are used in the LIDAR equations of predict that the fluorescence technique does have promise of **detecting bacteria** concns. of 3 .times. 10<sup>8</sup> organisms/m<sup>3</sup> at remote ranges of 1 km at night and 500 m in the day. Predictions of **Raman** scatter capabilities are indicated but not performed pending a contractor's report of **Raman** cross sections of microorganisms.

L9 ANSWER 24 OF 24 CAPLUS COPYRIGHT 2000 ACS

ACCESSION NUMBER: 1977:12450 CAPLUS  
 DOCUMENT NUMBER: 86:12450  
 TITLE: Action of carbon monoxide on bacteria as seen by laser-Raman **spectroscopy**  
 AUTHOR(S): Stoneham, M. E.; Webb, S. J.  
 CORPORATE SOURCE: Coll. Eng., Univ. Saskatchewan, Saskatoon, Sask., Can.  
 Searcher : Shears 308-4994



08/818534

SOURCE: IRCS Med. Sci.: Libr. Compend. (1976), 4(11),  
520

CODEN: IRLCDZ

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Laser-Raman spectroscopy of Escherichia coli  
cells exposed to CO gas showed changes not only in the metabolic  
activity of the cells but also in the metabolic time clock. The  
change in the pattern of the Raman shift lines was  
dependent on the time, after cell suspension, at which exposure to  
CO was commenced. Lazer-Raman spectroscopy may  
enable sequential in vivo metabolic activity of cells to be followed  
and permit the effects of a gas on them to be detd. rapidly.

(FILE 'MEDLINE, BIOSIS, EMBASE, LIFESCI, WPIDS, CONFSCI, SCISEARCH,  
JICST-EPLUS' ENTERED AT 16:06:00 ON 08 FEB 2000)

L10 23 S L9

L11 15 DUP REM L10 (8 DUPLICATES REMOVED)

L11 ANSWER 1 OF 15 BIOSIS COPYRIGHT 2000 BIOSIS

ACCESSION NUMBER: 1999:113594 BIOSIS

DOCUMENT NUMBER: PREV199900113594

TITLE: Raman optrode processes and devices for  
detection of chemicals and  
microorganisms.

AUTHOR(S): Grow, A. E.

CORPORATE SOURCE: 5882 Highplace Dr., San Diego, Calif. 92120 USA

PATENT INFORMATION: US 5866430 Feb. 2, 1999

SOURCE: Official Gazette of the United States Patent and  
Trademark Office Patents, (Feb. 2, 1999) Vol. 1219,  
No. 1, pp. 502-503.  
ISSN: 0098-1133.

DOCUMENT TYPE: Patent

LANGUAGE: English

L11 ANSWER 2 OF 15 BIOSIS COPYRIGHT 2000 BIOSIS

ACCESSION NUMBER: 1999:326993 BIOSIS

DOCUMENT NUMBER: PREV199900326993

TITLE: Detection of microbial life on minerals by UV  
Raman spectroscopy.

AUTHOR(S): Storrie-Lombardi, M. C. (1); Tsapin, A. I. (1);  
Nealson, K. H. (1); McDonald, G. D. (1); Sun, H. (1)

CORPORATE SOURCE: (1) Jet Propulsion Laboratory, California Institute  
of Technology, Pasadena, CA USA

SOURCE: Abstracts of the General Meeting of the American  
Society for Microbiology, (1999) Vol. 99, pp.  
378-379.  
Meeting Info.: 99th General Meeting of the American  
Society for Microbiology Chicago, Illinois, USA May  
Searcher : Shears 308-4994

08/818534

30-June 3, 1999 American Society for Microbiology  
. ISSN: 1060-2011.

DOCUMENT TYPE: Conference  
LANGUAGE: English

L11 ANSWER 3 OF 15 WPIDS COPYRIGHT 2000 DERWENT INFORMATION LTD  
ACCESSION NUMBER: 1998-531577 [45] WPIDS  
DOC. NO. NON-CPI: N1998-414807  
DOC. NO. CPI: C1998-159444  
TITLE: **Detection of microorganisms** in  
sample - comprises placing sample in medium  
containing antibodies, contacting medium with light  
and measuring light emitted from medium.  
DERWENT CLASS: B04 D16 J04 S03  
INVENTOR(S): NELSON, W H; SPERRY, J F  
PATENT ASSIGNEE(S): (RHOD-N) RHODE ISLAND HIGHER EDUCATION  
COUNTRY COUNT: 21  
PATENT INFORMATION:

| PATENT NO  | KIND | DATE     | WEEK      | LA | PG |
|--|------|----------|-----------|----|----|
| WO 9841842   | A1   | 19980924 | (199845)* | EN | 13 |
| RW: AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE   |      |          |           |    |    |
| W: AU CA JP  |      |          |           |    |    |
| AU 9864555   | A    | 19981012 | (199907)  |    |    |
| EP 966662  | A1   | 19991229 | (200005)  | EN |    |
| R: AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE |      |          |           |    |    |

APPLICATION DETAILS:

| PATENT NO  | KIND | APPLICATION    | DATE     |
|------------|------|----------------|----------|
| WO 9841842 | A1   | WO 1998-US4623 | 19980310 |
| AU 9864555 | A    | AU 1998-64555  | 19980310 |
| EP 966662  | A1   | EP 1998-910272 | 19980310 |
|            |      | WO 1998-US4623 | 19980310 |

FILING DETAILS:

| PATENT NO  | KIND        | PATENT NO  |
|------------|-------------|------------|
| AU 9864555 | A Based on  | WO 9841842 |
| EP 966662  | A1 Based on | WO 9841842 |

PRIORITY APPLN. INFO: US 1997-818534 19970314

AN 1998-531577 [45] WPIDS

AB WO 9841842 A UPAB: 19981111

**Detection of microorganisms** (A) comprises: (a)  
placing sample (S) in a medium containing antibodies (Ab) specific  
Searcher : Shears 308-4994

for (A), forming an AB-A complex; (b) contacting the medium with a beam of light energy, where some of the energy emitted from the medium is lower resonance enhanced **Raman** back-scattered energy, and (c) detecting the presence or absence of (A) based on a characteristic **spectral** peak of (A). Also claimed is a system for carrying out the method described above.

The medium is a fluid and (A) is a bacterium. The light energy is ultraviolet light in the range 242-257 nm. The method further comprises removing the Ab complex from the liquid medium and detecting the absence or presence of (A).

USE - The process is used for the environmental analysis for various consumer products, such as foods and liquids, and is useful for clinical analysis to provide rapid analysis of body fluids, e.g. blood, spinal fluid and urine.

ADVANTAGE - The process can be carried out with greater specificity, sensitivity and greater speed than previous known methods. The method has very little background interference and does not require any prior separation and culturing steps.

Dwg.1/1

L11 ANSWER 4 OF 15 MEDLINE DUPLICATE 1  
 ACCESSION NUMBER: 1998412734 MEDLINE  
 DOCUMENT NUMBER: 98412734  
 TITLE: Surface enhanced **Raman spectroscopic** monitor of P. acnes lipid hydrolysis in vitro.  
 AUTHOR: Weldon M K; Morris M D; Harris A B; Stoll J K  
 CORPORATE SOURCE: Department of Chemistry, University of Michigan, Ann Arbor 48109-1055, USA.  
 SOURCE: JOURNAL OF LIPID RESEARCH, (1998 Sep) 39 (9) 1896-9. Journal code: IX3. ISSN: 0022-2275.  
 PUB. COUNTRY: United States  
 Journal; Article; (JOURNAL ARTICLE)  
 LANGUAGE: English  
 FILE SEGMENT: Priority Journals  
 ENTRY MONTH: 199902  
 ENTRY WEEK: 19990204  
 AB Surface enhanced **Raman spectroscopy** (SERS) at a silver microelectrode was used to monitor bacterial hydrolysis of triglycerides in lipid mixtures that model sebaceous gland secretions. Mixtures of wax esters, squalene, triolein, and triisostearin were used as model skin secretions. The transformation was followed in vitro as changes in the SERS caused by hydrolysis of triglyceride to fatty acid. The fatty acid was adsorbed as its carboxylate, which is readily identified by the characteristic band at ca. 1395 cm<sup>-1</sup>. Co-adsorption of propionate was also observed. The technique can also confirm the presence of **bacteria** by **detection** of short chain carboxylic acids released as products of fermentation during the growth of these cells.

Searcher : Shears 308-4994

L11 ANSWER 5 OF 15 BIOSIS COPYRIGHT 2000 BIOSIS DUPLICATE 2  
 ACCESSION NUMBER: 1998:409080 BIOSIS  
 DOCUMENT NUMBER: PREV199800409080  
 TITLE: A comparative study of conserved protein interactions of the primary electron donor in photosynthetic purple bacterial reaction centers.  
 AUTHOR(S): Ivancich, Anabella; Mattioli, Tony A. (1)  
 CORPORATE SOURCE: (1) Sect. Biophys. Proteines Membranes, Dep. Biol. Cell. Mol., CEA CNRS URA 2096, CEA/Saclay, 91191 Gif-sur-Yvette cedex France  
 SOURCE: Photosynthesis Research, (March, 1998) Vol. 55, No. 2-3, pp. 207-215.  
 ISSN: 0166-8595.  
 DOCUMENT TYPE: Article  
 LANGUAGE: English  
 AB The pigment-protein interactions within the binding site of the bacteriochlorophyll (BChl) dimer constituting the primary electron donor (P) in several, native, photosynthetic bacterial reaction centers have been **determined** using Fourier transform **Raman spectroscopy**. For reaction centers whose primary sequence data are available, and assuming a structural analogy with the Rb. sphaeroides RC whose high-resolution three-dimensional structure is known, amino acid residues donating hydrogen bonds to P are proposed. Consequently, one may propose the microenvironment structure of the primary donors studied and correlate this deduced structure with the known absorption and redox properties of the primary donors. In this 'mini-review' of our past work, we group and classify the primary donors with respect to their specific H-bonding interactions with the protein. This classification reveals trends in the H-bonding and certain physicochemical properties such as the Pdegree/P.+ redox midpoint potential, the positive charge distribution over the dimeric primary donors in their oxidized radical cation state P.+, and the absorption maxima of the lower exciton Qy absorption band of P.

L11 ANSWER 6 OF 15 WPIDS COPYRIGHT 2000 DERWENT INFORMATION LTD  
 ACCESSION NUMBER: 1997-314239 [29] WPIDS  
 DOC. NO. NON-CPI: N1997-260136  
 DOC. NO. CPI: C1997-101136  
 TITLE: Measurement of survival of sealed freeze-dried microorganism without breaking - by subjecting to **Raman spectrum** analysis.  
 DERWENT CLASS: D16 S03  
 PATENT ASSIGNEE(S): (AJIN) AJINOMOTO KK; (KANA-N) ZH KANAGAWA KAGAKU GIJUTSU ACAD  
 COUNTRY COUNT: 1  
 PATENT INFORMATION:

08/818534

| PATENT NO   | KIND | DATE     | WEEK      | LA | PG |
|-------------|------|----------|-----------|----|----|
| JP 09121889 | A    | 19970513 | (199729)* |    | 5  |

APPLICATION DETAILS:

| PATENT NO   | KIND | APPLICATION    | DATE     |
|-------------|------|----------------|----------|
| JP 09121889 | A    | JP 1995-283589 | 19951031 |

PRIORITY APPLN. INFO: JP 1995-283589 19951031

AN 1997-314239 [29] WPIDS

AB JP 09121889 A UPAB: 19970716

Measurement of survival of sealed freeze-dried microorganism, comprises subjected sealed freeze-dried microorganism to **Raman spectrum** analysis, whereby ratio of oxygen to carbon dioxide in the sealed container is measured.

ADVANTAGE - Without killing **microorganism**, survival can be **detected**.

Dwg.0/2

L11 ANSWER 7 OF 15 MEDLINE

DUPLICATE 3

ACCESSION NUMBER: 96112712 MEDLINE

DOCUMENT NUMBER: 96112712

TITLE: Dairy product analysis: identification of **microorganisms** by mid-infrared **spectroscopy** and determination of constituents by **Raman spectroscopy**

AUTHOR: Fehrmann A; Franz M; Hoffmann A; Rudzik L; Wust E

CORPORATE SOURCE: Milchwirtschaftliche Lehr- und Untersuchungsanstalt und Fachhochschule Hannover, Germany.

SOURCE: JOURNAL OF AOAC INTERNATIONAL, (1995 Nov-Dec) 78 (6) 1537-42.

Journal code: BKS. ISSN: 1060-3271.

PUB. COUNTRY: United States

Journal; Article; (JOURNAL ARTICLE)

LANGUAGE: English

FILE SEGMENT: Priority Journals

ENTRY MONTH: 199610

AB Identification of microorganisms by traditional microbiological methods is time consuming. The German Federal Health Office has developed a method using mid-infrared **spectroscopy** to identify microorganisms rapidly. This method has been modified for application to microorganisms important in the dairy industry. Mid- and near-infrared **spectroscopies** are well-established methods for quantitative measurements of fat, protein, lactose, and solid content in a variety of products. A disadvantage of both

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methods is the huge absorption due to water; extraction of other components is complicated and can be achieved only statistically. With **Raman spectroscopy**, water causes less absorption. We investigated the use of **Raman spectroscopy** as a quantitative method for milk powder.

L11 ANSWER 8 OF 15 WPIDS COPYRIGHT 2000 DERWENT INFORMATION LTD  
 ACCESSION NUMBER: 1994-183524 [22] WPIDS  
 DOC. NO. NON-CPI: N1994-144848  
 DOC. NO. CPI: C1994-083226  
 TITLE: **Determining effectiveness of antibiotics against bacteria - e.g. using ultraviolet resonance Raman spectroscopy.**  
 DERWENT CLASS: B04 D16 S03  
 INVENTOR(S): NELSON, W H  
 PATENT ASSIGNEE(S): (RHOD-N) RHODE ISLAND HIGHER EDUCATION; (NELS-I) NELSON W H  
 COUNTRY COUNT: 2  
 PATENT INFORMATION:

| PATENT NO  | KIND | DATE     | WEEK      | LA | PG |
|------------|------|----------|-----------|----|----|
| WO 9411526 | A1   | 19940526 | (199422)* | EN | 19 |
| AU 9456066 | A    | 19940608 | (199435)  |    |    |
| US 5573927 | A    | 19961112 | (199651)  |    | 4  |

## APPLICATION DETAILS:

| PATENT NO  | KIND | APPLICATION     | DATE     |
|------------|------|-----------------|----------|
| WO 9411526 | A1   | WO 1993-US11036 | 19931118 |
| AU 9456066 | A    | AU 1994-56066   | 19931118 |
| US 5573927 | A    | US 1992-977670  | 19921118 |

## FILING DETAILS:

| PATENT NO  | KIND       | PATENT NO  |
|------------|------------|------------|
| AU 9456066 | A Based on | WO 9411526 |

PRIORITY APPLN. INFO: US 1992-977670 19921118

AN 1994-183524 [22] WPIDS

AB WO 9411526 A UPAB: 19940722

Determining the effectiveness of an antibiotic against a bacteria comprises: (a) creating **spectra** of at least a first set of cells of an initially cultured target bacteria; (b) culturing the target cells of a second set in a growth medium which is free of antibiotic; (c) displaying the **spectra** of the cells of the second set prior to mitosis; (d) culturing the target cells of a

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third set in a growth medium contg. an antibiotic of interest; (e) displaying the **spectra** of the cells of a third set prior to mitosis; and (f) comparing the **spectra** of the second and third sets of **bacteria** to **determine** the effectiveness of the antibiotic.

ADVANTAGE - The process is quicker than prior art processes.

Dwg.1/4

ABEQ US 5573927 A UPAB: 19961219

A method for determining the effectiveness of an antibiotic against a bacteria which comprises:

displaying **Raman spectra** of a first set of target cells of an initially cultured bacteria *E. coli*;  
culturing said target cells of a second set in a growth medium free of antibiotic;  
displaying the **Raman spectra** of the cells of the second set prior to mitosis;  
culturing said target cells of a third set in a growth medium containing an antibiotic of interest;  
displaying the **Raman spectra** of the target cells of the third set prior to mitosis; and  
displaying ribosome peaks and comparing the ribosome peaks of the **spectra** of the second and third sets.

Dwg.0/4

L11 ANSWER 9 OF 15 SCISEARCH COPYRIGHT 2000 ISI (R)  
ACCESSION NUMBER: 94:193460 SCISEARCH  
THE GENUINE ARTICLE: NB997  
TITLE: VIBRONIC MIXING IN THE STRONG ELECTRONIC COUPLING  
LIMIT - **SPECTROSCOPIC** EFFECTS OF FORBIDDEN  
TRANSITIONS  
AUTHOR: LATHROP E J P; FRIESNER R A (Reprint)  
CORPORATE SOURCE: COLUMBIA UNIV, DEPT CHEM, NEW YORK, NY, 10027  
(Reprint); COLUMBIA UNIV, DEPT CHEM, NEW YORK, NY,  
10027  
COUNTRY OF AUTHOR: USA  
SOURCE: JOURNAL OF PHYSICAL CHEMISTRY, (17 MAR 1994) Vol.  
98, No. 11, pp. 3050-3055.  
ISSN: 0022-3654.  
DOCUMENT TYPE: Article; Journal  
FILE SEGMENT: PHYS  
LANGUAGE: ENGLISH  
REFERENCE COUNT: 12

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB We consider an excited-state manifold in which an allowed transition is strongly coupled electronically to a forbidden (dark) state and use nonperturbative methods to determine the effects of this coupling on the optical properties. We find that the strong coupling limit is qualitatively different from the usual weak coupling case; in particular, the bright state **spectrum** is

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substantially altered, displaying renormalized Franck-Condon factors which can be observed in absorption, hole burning, and resonance Raman experiments. We map out the magnitude of this renormalization as a function of various parameters in the theory and note that there is a phase-transition-like behavior as one passes from the weak to the strong coupling regimes. Finally, we suggest that this mechanism provides a straightforward explanation for the hole-burning **spectra** observed for the primary donor in the **bacterial** photosynthetic reaction center and **determine** a region of parameter space compatible with the experimental results.

L11 ANSWER 10 OF 15 EMBASE COPYRIGHT 2000 ELSEVIER SCI. B.V.DUPLICATE

4

ACCESSION NUMBER: 93223137 EMBASE  
DOCUMENT NUMBER: 1993223137  
TITLE: FT-IR studies on the triplet state of P680 in the photosystem II reaction center: Triplet equilibrium within a chlorophyll dimer.  
AUTHOR: Noguchi T.; Inoue Y.; Satoh K.  
CORPORATE SOURCE: Solar Energy Research Group, Physical/Chemical Research Institute, Wako, Saitama 351-01, Japan  
SOURCE: Biochemistry, (1993) 32/28 (7186-7195).  
ISSN: 0006-2960 CODEN: BICHAW  
COUNTRY: United States  
DOCUMENT TYPE: Journal; Article  
FILE SEGMENT: 004 Microbiology  
029 Clinical Biochemistry  
LANGUAGE: English  
SUMMARY LANGUAGE: English  
AB The structure and molecular interactions of the primary donor (P680) in the reaction center (D1-D2-cytochrome b-559 complex) of photosystem II (PS II) have been investigated by detecting light-induced FT-IR difference **spectra** upon the formation of its triplet state (3P680). The 3P680/P680 **spectrum** obtained was analyzed by comparing it with difference **spectra** between the ground and lowest triplet states of purified chlorophyll a (Chl) in organic solvents. The negative peaks at 1669 and 1707 cm<sup>-1</sup> accompanied by the positive peaks at 1627 and 1659 cm<sup>-1</sup> in the 3P680/P680 **spectrum** were assigned to the keto C=O stretching mode, and the appearance of these two pairs of bands indicated that P680 has a dimeric structure analogous to that of the bacterial primary donor. From the band positions of the keto and carbomethoxy C=O stretches, the hydrogen-bonding properties of these two Chl molecules were found to be asymmetrical; in one Chl molecule both the keto and carbomethoxy C=O groups form hydrogen bonds, while in the other Chl molecule the keto C=O is not hydrogen-bonded whereas the carbomethoxy C=O probably is hydrogen-bonded. The temperature dependence of the intensity ratios  
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of the keto C=O bands revealed that the triplet state is equilibrated between the two Chl molecules with an energy gap of 8.4  $\pm$  0.7 meV. Most of the triplet population was found to be localized on one Chl molecule (86% at 80 K), in which both of the two C=O groups are hydrogen-bonded, that is probably attached to the D1 subunit. Considering the structure of the **bacterial** reaction center **determined** by X-ray crystallography and the sequence homology between the D1 and D2 subunits of PS II and the L and M subunits of bacteria, a model of the P680 structure and its interactions with apoproteins has been proposed.

L11 ANSWER 11 OF 15 SCISEARCH COPYRIGHT 2000 ISI (R)

ACCESSION NUMBER: 93:696132 SCISEARCH

THE GENUINE ARTICLE: MG624

TITLE: ULTRAVIOLET MICRO-RAMAN

SPECTROGRAPH FOR THE DETECTION OF  
SMALL NUMBERS OF BACTERIAL-CELLS

AUTHOR: CHADHA S; NELSON W H (Reprint); SPERRY J F

CORPORATE SOURCE: UNIV RHODE ISL, DEPT CHEM, KINGSTON, RI, 02881; UNIV  
RHODE ISL, DEPT MICROBIOL, KINGSTON, RI, 02881

COUNTRY OF AUTHOR: USA

SOURCE: REVIEW OF SCIENTIFIC INSTRUMENTS, (NOV 1993) Vol.  
64, No. 11, pp. 3088-3093.  
ISSN: 0034-6748.

DOCUMENT TYPE: Article; Journal

FILE SEGMENT: PHYS; ENGI

LANGUAGE: ENGLISH

REFERENCE COUNT: 61

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB The construction of a practical UV micro-Raman **spectrograph** capable of selective excitation of bacterial cells and other microscopic samples has been described. A reflective objective is used to focus cw laser light on a sample and at the same time collect the scattered light at 180-degrees. With the aid of a quartz lens the image produced is focused on the slits of a **spectrograph** equipped with a single 2400 grooves/mm grating optimized for 250 nm. **Spectra** were detected by means of a blue-intensified diode array detector. Resonance **Raman spectra** of *Bacillus subtilis* and *Flavobacterium capsulatum* excited by the 257.2 nm output of a cw laser were recorded in the 900-1800  $\text{cm}^{-1}$  region. Bacterial cells were immobilized on a quartz plate by means of polylysine and were counted visually. Cooling was required to retard sample degradation. Sample sizes ranged from 1 to 50 cells with excitation times varying from 15 to 180 s. Excellent **spectra** have been obtained from 20 cells in 15 s using a **spectrograph** having only 3% throughput.

L11 ANSWER 12 OF 15 BIOSIS COPYRIGHT 2000 BIOSIS DUPLICATE 5

ACCESSION NUMBER: 1989:413157 BIOSIS

Searcher : Shears 308-4994

08/818534

DOCUMENT NUMBER: BR37:68620  
TITLE: DETECTION AND IDENTIFICATION OF  
BACTERIA BY MEANS OF UV EXCITED RESONANCE  
RAMAN SPECTRA.  
AUTHOR(S): NELSON W H; DALTERIO R A; SPERRY J F  
CORPORATE SOURCE: KINGSTON, R.I., USA.  
ASSIGNEE: THE BOARD OF GOVERNORS FOR HIGHER  
EDUCATION, STATE OF RHODE ISLAND AND PROVIDENCE  
PLANTATIONS  
PATENT INFORMATION: US 4847198 11 Jul 1989  
SOURCE: Off. Gaz. U. S. Pat. Trademark Off., Pat., (1989)  
1104 (2), 1228.  
CODEN: OGUPE7. ISSN: 0098-1133.  
DOCUMENT TYPE: Patent  
FILE SEGMENT: BR; OLD  
LANGUAGE: English

L11 ANSWER 13 OF 15 LIFESCI COPYRIGHT 2000 CSA  
ACCESSION NUMBER: 89:17215 LIFESCI  
TITLE: Detection and identification of  
bacteria by means of ultra-violet excited  
resonance Raman spectroscopy.  
AUTHOR: Nelson, W.H.; Dalterio, R.A.; Sperry, J.F.  
CORPORATE SOURCE: Board of Governors, State of Rhode Island,  
Providence, RI (USA)  
PATENT INFO.: US 4847198 1989  
SOURCE: (1989) . US Cl. 435-34; Int. Cl. C12Q 1/04, C12N  
13/00, G01J 3/44..  
DOCUMENT TYPE: Patent  
FILE SEGMENT: A  
LANGUAGE: English

AB The authors describe a method for the identification of a bacterium which comprises: exciting taxonomic markers in a bacterium with a beam of ultraviolet energy, some of said energy emitted from the bacterium as a lower resonance enhanced Raman back-scattered energy; collecting the resonance enhanced Raman back-scattered energy substantially in the absence of fluorescence; converting the resonance enhanced Raman back-scattered energy into spectra which corresponds to the taxonomic markers in said bacterium; and displaying the spectra whereby the bacterium may be identified.

L11 ANSWER 14 OF 15 BIOSIS COPYRIGHT 2000 BIOSIS  
ACCESSION NUMBER: 1980:186242 BIOSIS  
DOCUMENT NUMBER: BA69:61238  
TITLE: A RESONANCE RAMAN METHOD FOR THE RAPID  
DETECTION AND IDENTIFICATION OF  
BACTERIA IN WATER.  
AUTHOR(S): HOWARD W F JR; NELSON W H; SPERRY J F  
Searcher : Shears 308-4994



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Total number of pages: 20

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